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E2A AAN A105 A403

(56) Documents Cited

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US 5289621 A US 4981310 A US 4739543 A

(58) Field of Search

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INT CL⁶ F16B 5/06 5/12 21/08

(54) Trim clip

(57) A clip 10 is disclosed for retaining an item of vehicle trim in position relative to the vehicle body which has an aperture therethrough. The clip comprises a pair of flat sections 12, 14 between which the trim item is retained, and opposing flexible arms 22 supported on a rod section 20 and having stepped surfaces 30 for engaging with the sides of an aperture. The stepped surfaces 30 enable the arms 22 to engage with apertures in materials of various thicknesses.

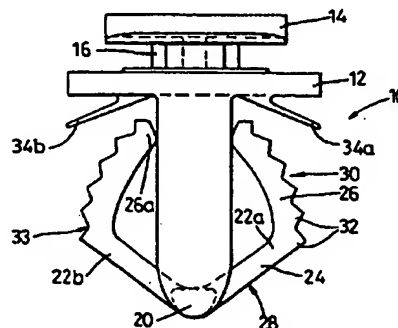


Fig. 1

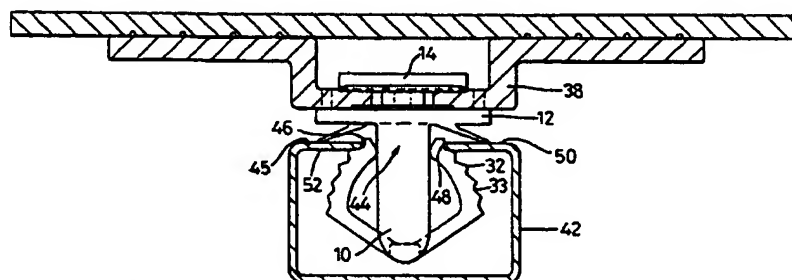
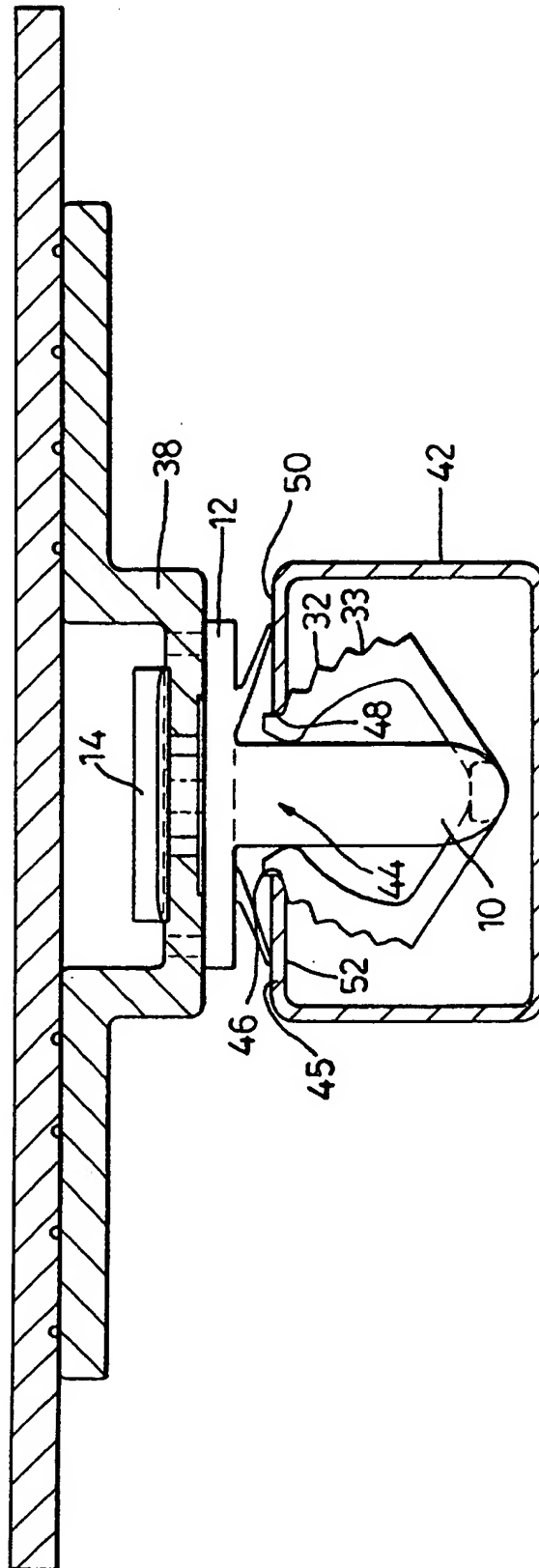


Fig. 3

A perspective view of the first embodiment of the device. The device consists of a main body (10) with a top surface (14) and a front face (12). A vertical wall (18a) is positioned on the front face, featuring a series of horizontal ridges or steps (18b, 18c, 18d). A curved, flared section (20a) extends from the bottom of the vertical wall, ending in a pointed tip (20b). A small, rectangular protrusion (22a) is located near the base of the vertical wall. A large, irregularly shaped opening (34a) is formed in the front face, revealing internal components (34b). A small, rectangular feature (22b) is visible on the side of the device.

Fig. 2

**Fig. 3**

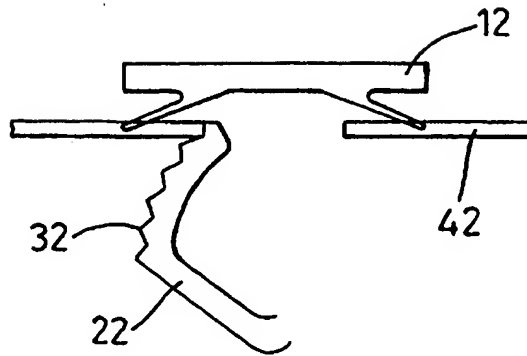


Fig. 4a

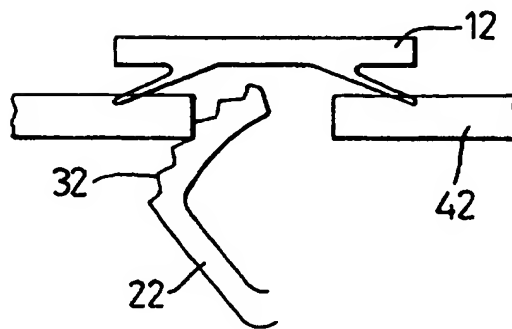


Fig. 4b

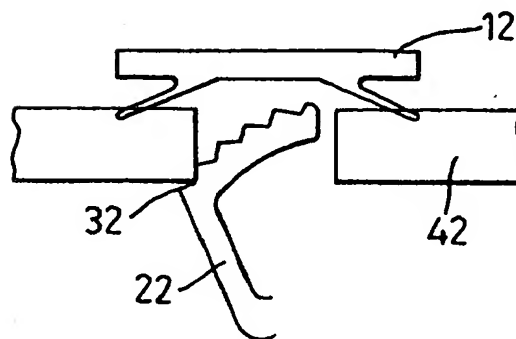


Fig. 4c

A Clip

The present invention relates to clips and is particularly useful in clips for use in retaining vehicle trim elements in position on a vehicle body.

The present invention provides a clip for retaining an
5 item in position relative to a supporting means which has
an aperture therethrough, the clip comprising a retaining
portion for engagement with the item to be retained, first
and second engaging means for engaging opposite sides of
the aperture, at least the first engaging means comprising
10 an arm resiliently supported at one end in a position
spaced from the retaining portion, having a leading edge
towards said one end, and having a stepped portion towards
its other end having a plurality of steps formed thereon at
different distances from the retaining portion, the leading
15 edge being arranged such that it will engage with the side
of the aperture when the arm is passed through it so as to
move the arm in one direction, and the stepped portion
being arranged such that, as the arm is passed further
through the aperture, the arm will move in the opposite
20 direction as the steps pass out of the aperture, thereby to
retain the clip in the aperture.

Preferably the second engaging means comprises the same
features as the first.

A preferred embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 is an end view of a clip according to the
5 invention;

Figure 2 is a perspective view of the clip of Figure 1;

Figure 3 is a section through the clip of Figure 1 in use; and

Figures 4a, 4b and 4c are diagrammatic representations
10 of part of the clip of Figure 1 in use on panels of various thicknesses.

Referring to Figures 1 and 2 a clip 10 comprises a flat oblong base portion 12, and a, smaller, oblong flat portion 14 supported by a block 16 so as to be parallel to, and
15 spaced from, the base portion 12. Four support posts 18a, 18b, 18c, 18d are arranged in a row on the centre line of the base portion 12, extending perpendicularly from it on the opposite side to the flat portion 14. The outermost support posts 18a, 18d are at opposite ends of the base
20 portion 12. A support rod 20 extends across the ends of the support posts 18, its ends being joined to, and supported by, the outermost support posts 18a, 18d, and the inner support posts 18b, 18c being joined to it and supporting it at respective intermediate points.

The support rod 20 can therefore be considered as comprising three sections 20a, 20b, 20c each extending between two of the support posts 18. Each section 20a, 20b, 20c of the support rod 20 supports a respective engaging
5 arm 22a, 22b, 22c. Each arm 22 comprises two sections, the lower 24 of which extends from the support rod 20 in a direction which is towards one side of the clip and towards the base portion, at an acute angle to the base portion 12, and the upper 26 of which extends back towards the centre
10 of the clip and towards the base portion, again at an acute angle to the base portion 12. The two sections 24, 26 of each arm 22 are approximately at right angles to each other, and the free end 26a of the upper portion is spaced slightly from the base portion 12. The outer surface 28 of
15 the lower section 24 is smooth and forms a leading edge the function of which is described below, whereas the outer surface 30 of the upper section 26 is serrated, having a series of ridges or steps 32 running across it with grooves 33 between them. The central arm 22b extends towards one
20 side of the clip, and the two end arms 22a, 22c extend towards the other side. A pair of cushioning flaps 34a, 34b extend from the base portion 12 on the same side as the support posts 18.

The clip is formed as a single plastics moulding.

25 Referring to Figure 3, in use the clip 10 is used to attach a trim element 38 of a vehicle to an extruded box section aluminium part 42 of a vehicle body which has an

aperture 44 through one of its sides 45. The aperture 44 has two parallel opposite sides 46, 48. The trim element 38 is retained between the base portion 12 and the flat portion 14, the block 16 between them having been slid into
5 a slot in the trim element. The insertion of the clip 10 into the aperture 44 can be considered as having two stages. In the first stage the leading edges 28 of the arms 22 engage with the corners between the upper surface 50 of the extrusion 42 and the sides 46, 48 of the aperture 44
10 which causes the lower portions 24 of the arms 22 to bend elastically and the upper portions 26 of the arms 22 to be rotated inwards about the support rod 20. The second stage of insertion occurs when the lower portions 24 of the arms have passed through the aperture and the upper portions 26
15 are passing through. As the clip is pushed further, the arms 22 spread outwards as subsequent ridges 32 pass through the aperture. As each ridge 32 passes out of the under side of the aperture 44 it moves outwards behind the aluminium extrusion 42 and the groove 33 between that ridge
20 and the next becomes engaged on one of the corners between the under side 52 of the extrusion and the sides 46, 48 of the aperture. When the cushioning flaps 34 are pressed against the extrusion 42 the clip comes to rest, being locate vertically (as shown in Figure 3) by the engagement
25 of the ridges 32 and the cushioning flaps 34 with the extrusion 42, and horizontally (as shown in Figure 3) by

the opposing ridged faces 30 engaging with the opposite sides of the aperture 44.

Referring to Figures 4a, 4b and 4c, which only show part of a clip according to the invention with reference numerals corresponding to those in Figures 1 to 3 for corresponding parts, it will be seen that the clip can be used in apertures through sheets of material of various thicknesses. The thickness of the material will only alter the particular ridge 32 which finally rests against the sides of the aperture when the clip is fully inserted.

CLAIMS

1. A clip for retaining an item in position relative to a supporting means which has an aperture therethrough, the clip comprising a retaining portion for engagement with the item to be retained, first and second engaging means for engaging first and second opposite sides of the aperture, at least the first engaging means comprising an arm resiliently supported at one end in a position spaced from the retaining portion, having a leading edge towards said one end, and having a stepped portion towards its other end having a plurality of steps formed thereon at different distances from the retaining portion, the leading edge being arranged such that it will engage with the side of the aperture when the arm is passed through it so as to rotate the arm in one direction, and the stepped portion being arranged such that, as the arm is passed further through the aperture, the arm will rotate in the opposite direction as the steps pass out of the aperture, thereby to retain the clip in the aperture.
2. A clip according to claim 1 wherein the second engaging means comprises an arm resiliently supported at one end in a position spaced from the retaining portion, having a leading edge towards said one end, and having a stepped portion towards its other end having a plurality of steps formed thereon at different distances from the retaining portion, the

leading edge being arranged such that it will engage with the side of the aperture when the arm is passed through it so as to rotate the arm in one direction, and the stepped portion being arranged such that, as the arm is passed further through the aperture, the arm will rotate in the opposite direction as the steps pass out of the aperture.

3. A clip according to claim 2 comprising a third engaging means for engaging the first side of the aperture, the second engaging means being between the first and third engaging means.
4. A clip according to any foregoing claim wherein at least one of the engaging means is supported by a support section which extends in a direction parallel to the retaining section and is supported at each end.
5. A clip according to claim 4 wherein all of the retaining means are supported on said support section.
6. A clip according to any foregoing claim wherein the or each arm comprises two sections arranged at an angle to each other, one of which has said leading edge thereon, and the other of which forms said stepped portion.
7. A clip substantially as hereinbefore described with reference to the accompanying drawings.

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Claims searched: 1-6

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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E2A (AAN, ACAT)

Int Cl (Ed.6): F16B (5/06, 5/12, 21/08)

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 212 001 A (KITAGAWA) see fig. 2	1,2,6
X	GB 1 055 945 A (UNITED-CARR) see fig. 1	1,2,6
X	EP 0 519 856 A1 (PERIZ) see col. 4, line 56 - col. 5 line 3	1,2,6
X	US 5 289 621 A (NIFCO) see figs. 1,2	1,2,6
X	US 4 981 310 A (LEGRIS) see col. 2, paras. 5,6	1,2,6
X	US 4 739 543 A (FORD) see col. 3, lines 43-47	1,2,4-6

X Document indicating lack of novelty or inventive step
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